

Appl. No. 09/972,966
Amendment dated December 6, 2005
Reply to Office Action of September 6, 2005

IN THE DRAWINGS:

Please amend the second occurrence of Fig. 6A as follows. A replacement drawing sheet is provided reflecting the drawing change.

In the second Fig. 6A, please change the label "Fig. 6A" to "Fig. 6B".

COMMENTS AND RESPONSE

In view of the comments below, Applicant respectfully requests that the Examiner reconsider the present application including objected to claims 1-8 and rejected claims 9-24, as amended, and withdraw the claim objections and rejections.

Claim Objections

The Examiner objected to claims 1-8, and 9, 11, 15, 19, 20, and 25 based on a number of informalities. By this response, Applicant has addressed these objections.

With respect to claims 1, 9, 11, 15, 19, 20, and 25, the Examiner has requested that the first use of the term "UWB" be replaced with "ultrawide bandwidth (UWB)." By this response, Applicant has done so. Where a claim only used the term UWB once, it has simply been replaced with "ultrawide bandwidth," without an indication of the abbreviation.

With respect to claims 1, 2, and 4-8, the Examiner has also requested that the preamble be amended to recite "a UWB self-noise cancellation mechanism," apparently to conform to what is recited in claim 3. While Applicant acknowledges that this would be an acceptable amendment, he prefers to amend claim 3 to eliminate this language. Claims 1-8 now all simply recite "a self-noise cancellation mechanism." However, as noted above, Applicant has amended the claims as needed to make certain that the first use of the abbreviation UWB is defined in each set of claims.

With respect to claim 5, the Examiner has asserted that the term "the incoming RF UWB signal" in line 2 should read "an incoming RF UWB signal." Applicant respectfully traverses this objection since the term receives proper antecedent basis in claim 1, from which claim 5 depends. In particular, claim 1, as amended, recites in lines 5 and 6: "a mixer for combining the UWB bi-phase signal with an incoming RF UWB signal having a second set pattern."

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These amendments are not being made to narrow the scope of the claims or to distinguish over a reference, but solely to better recite the claimed invention. As a result, they should not serve to limit the application of the doctrine of equivalents with respect to these claims.

For at least the reasons given above, Applicant submits that all of the informalities noted by the Examiner have been corrected. Applicant therefore respectfully requests that the Examiner withdraw the objection to claims 1-8, and 9, 11, 15, 19, 20, and 25.

Claim Rejections – 35 U.S.C. §102

The Examiner has rejected claims 10, 11, 14-16, 18-20, 22, 23, and 25 under 35 U.S.C. § 102(e) as being allegedly anticipated by United States Published Patent Application No. US 2003/0053555 to Richards et al. ("Richards"). Applicant respectfully traverses this rejection.

By this response, Applicant has cancelled claim 25, thus rendering this rejection moot as it pertains to this claim.

The present invention, as recited in claims 10, 11, 14-16, 18-20, and 22, involves a mode selection mechanism in which two different reference signals are provided: a simple clock signal at one clock frequency, and a modulated pulse stream (or series of UWB bi-phase signals) at a second clock frequency. Richards does not disclose or suggest this feature. However, in an effort to expedite prosecution, Applicant has amended claims 10, 14, 18, 20, and 23 to better recite this aspect of the invention.

Claim 10, as amended, recites "a pulse forming network for generating a modulated pulse stream in response to the second clock signal," and "a switch for selecting the first clock signal when a first receive mode of operation is selected, and for selecting the modulated pulse stream when a second receive mode of operation is selected." Claim 14, as amended, recites "a pulse

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forming network for generating a modulated pulse stream in response to the first divided clock signal," and "a signal processor for processing the received signal with the second divided clock signal and the modulated pulse stream." Claim 18, as amended, recites "means for generating a modulated pulse stream in response to the first divided clock signal," and "means for processing a received signal with the second divided clock signal and the modulated pulse stream." Claim 20, as amended, recites "a pulse forming network for producing a series of ultrawide bandwidth (UWB) bi-phase signals based on the second divided clock signal," and "a switch for providing a selected reference signal, the selected clock signal being the first divided clock signal when a first receive mode of operation is selected, and the series of UWB bi-phase signals when a second receive mode of operation is selected." In each of these claims, a switch selects between a clock signal and a modulated pulse stream, or between a clock signal and a series of UWB bi-phase signals.

An exemplary embodiment of these various elements can be seen in elements 535, 540, 545, 547, and 550 of Applicant's FIG. 5. As described in Applicant's specification, the second signal switch 535 and the TX data switch 547 determine the operation mode of the transceiver 500, either an ultrawide bandwidth (UWB) mode or a narrowband (NB) mode. In a UWB mode, the second signal switch 535 is connected to the PFN 550 to select the use of a UWB signal, and the TX data switch 547 is connected to the PFN 525. In an NB mode, the second signal switch 535 is connected to the first divide circuit 540 to select the use of a relatively narrow band signal, and the TX data switch 547 is connected to the PFAC 525. Thus in a UWB mode the PFN 550 provides a modulated pulse stream to the second signal switch 535, and in an NB mode the first divide circuit 540 provides either an FM signal or a tone to the second signal switch 535. (See, e.g., Applicant's specification, paragraphs [0097] through [0106], and FIG. 5.)

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As these amended claims show, in each mode, the recited switch selects a very different signal. In contrast, Richards simply shows a coarse timing generator 404 in which generates a coarse timing signal 428 that subdivides intervals of a frame reference signal 432 into relatively coarse time intervals. (See e.g., Richards, paragraph [0065], and FIG. 4.) In this coarse timing generator 404, two control bits (D0 and D1) are used as configuration bits to control a divide ratio applied to a reference clock. A MUX 908 selects one of three clocks (a direct reference clock, a divided by two version of the reference clock, and a divided by four version of the reference clock) as a divided REF CLK according to the value of D0 and D1. (See e.g., Richards, paragraphs [0097] to [0098], and FIG. 9.) Thus, the MUX 908 in Richards selects between multiple possible divided REF CLKS, each of which is the same sort of clock signal, just at a different frequency.

Nothing in Richards discloses or suggests a system or method in which a switch selects between a clock signal and a modulated pulse stream, or between a clock signal and a series of UWB bi-phase signals, as recited in claims 10, 14, 18, or 20.

In addition, Richards selects a divided ratio for the divided REF CLK based on the value of the bits D0 and D1, which do not appear to designate a receive mode. Nothing in Richards discloses or suggests that the selection of the divide ratio of the divided REF CLK be based on what receive mode of operation is desired, as would be required by claims 10, 14, 18, or 20. Instead, the divide ratio appears to be set based on a desired system frame rate. (See e.g., Richards, paragraph [0101].)

Claim 11 depends from claim 10, and is allowable for at least the reasons given above for claim 10. Claims 15 and 16 depend from claim 14, and are allowable for at least the reasons given above for claim 14. Claim 19 depends from claim 18, and is allowable for at least the

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reasons given above for claim 18. Claim 22 depends from claim 20, and is allowable for at least the reasons given above for claim 20.

Claim 23, as amended, recites "dividing the base clock signal by a first integer to generate a first divided clock signal at a first divided clock frequency if an ultrawide bandwidth receive mode is determined," and "dividing the base clock signal by a second integer to generate a second divided clock signal at a second divided clock frequency if a narrowband receive mode is determined."

Nothing in Richards discloses or suggests a system or method in which a switch selects between clock signals based on a receive mode. And in particular, Richards clearly does not disclose or suggest selecting between clock signals based on whether a receive mode is a UWB receive mode or a NB receive mode, as recited in claim 23.

Richards discloses setting a divide ratio in a coarse timing generator 404 based on a desired system frame rate, not a receive mode. (See e.g., Richards, paragraphs [0097], [0098], and [0101].) In fact, Richards does not disclose a system that can switch between a UWB mode and a NB mode at all. The system disclosed in Richards is directed to a UWB impulse radio. (See, e.g., Richards, paragraphs [0003] through [0006], [0014], and [0051].) As a result, nothing in Richards implies that it can operate in a separate NB mode. So it would be improper read Richards as showing such a feature.

Claim 24 depends from claim 23, and is allowable for at least the reasons given above for claim 23.

Based on at least the reasons given above, Applicant respectfully requests that the Examiner withdraw the rejection of claims 10, 11, 14-16, 18-20, 22, 23, and 25 under 35 U.S.C. § 102(e) as being allegedly anticipated by Richards.

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The Examiner has rejected claims 10, 14, 16, and 23 under 35 U.S.C. § 102(e) as being allegedly anticipated by United States Patent No. 6,249,445 to Sugasawa ("Sugasawa").
Applicant respectfully traverses this rejection.

As noted above, amended claim 10 recites "a pulse forming network for generating a modulated pulse stream in response to the second clock signal," and "a switch for selecting the first clock signal when a first receive mode of operation is selected, and for selecting the modulated pulse stream when a second receive mode of operation is selected;" and amended claim 14 recites "a pulse forming network for generating a modulated pulse stream in response to the first divided clock signal," and "a signal processor for processing the received signal with the second divided clock signal and the modulated pulse stream." Nothing in Sugasawa discloses or suggests a system or method in which a switch selects between a clock signal and a modulated pulse stream, as recited in claims 10 and 14.

Sugasawa simply shows a system in which a switching circuit 4 outputs one clock signal selected from among a plurality of clock signals CLK1 to CLKn as a clock signal CIN. The clock signals CLK1 to CLKn are the clock signals whose frequencies are different from each other, with the clock signal CLK1 having the highest frequency, and the clock signal CLKn having the lowest frequency. In each case, the output signal CIN is a clock signal. (See, e.g., Sugasawa, col. 3, lines 51-60, col. 13, lines 4-8, and FIGs. 3 and 12.)

In addition, as noted above, amended claim 23 recites "dividing the base clock signal by a first integer to generate a first divided clock signal at a first divided clock frequency if an ultrawide bandwidth receive mode is determined," and "dividing the base clock signal by a second integer to generate a second divided clock signal at a second divided clock frequency if a narrowband receive mode is determined."

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Nothing in Sugasawa discloses or suggests a system or method in which a switch selects between clock signals based on a receive mode, as required by claims 10, 14, and 23. And in particular, Sugasawa clearly does not disclose or suggest selecting between clock signals based on whether a receive mode is a UWB receive mode or a NB receive mode, as recited in claim 23.

Sugasawa discloses a switching circuit that selects a clock signal in response to an output voltage. When the voltage V_{OUT} is lower than a standard voltage V_{REF} , a clock signal having a relatively high frequency is selected as a clock signal CIN. When the voltage V_{OUT} is higher than the standard voltage V_{REF} , a clock signal having a relatively low frequency is selected as the clock signal CIN. (See, e.g., Sugasawa, abstract, col. 3, line 51, through col. 4, line 3, col. 13, lines 4-8, and FIGs. 3 and 12.) The clock signal chosen as CIN is thus not chosen based on a receive mode. Nothing in Sugasawa discloses anything regarding different receive modes, either ultrawide bandwidth or narrowband. In fact, Sugasawa does not even mention ultrawide bandwidth or narrowband operation at all.

Claim 16 depends from claim 14, and is allowable for at least the reasons given above for claim 14.

Based on at least the reasons given above, Applicant respectfully requests that the Examiner withdraw the rejection of claims 10, 14, 16, and 23 under 35 U.S.C. § 102(e) as being allegedly anticipated by Sugasawa.

The Examiner has rejected claim 9 under 35 U.S.C. § 102(e) as being allegedly anticipated by United States Published Patent Application No. US 2003/0161411 to McCorkle et al. ("McCorkle"). Applicant respectfully traverses this rejection. However, in an effort to expedite prosecution, Applicant has amended claim 9 to better recite the invention.

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In particular, amended claim 9 recites "means for producing an internally-generated ultrawide bandwidth (UWB) bi-phase signal having a first arranged pattern," and "means for receiving an incoming RF signal having a second arranged pattern," "wherein a first portion of the first arranged pattern is substantially the same in shape and is the same in polarity with respect to a third portion of the second arranged pattern," and "wherein a second portion of the first arranged pattern is substantially the same in shape and inverted in polarity with respect to a fourth portion of the second arranged pattern." This is shown by way of example in Applicant's FIGs. 6D and 6E and associated portions of Applicant's specification. McCorkle does not disclose or suggest this feature.

The Examiner has cited the wavelet code generator 242 in McCorkle as showing the recited means for producing an internally-generated UWB bi-phase signal having a first arranged pattern, and the antenna 200 as showing the recited means for receiving an incoming RF signal having a second arranged pattern. (See, e.g., McCorkle, FIG. 36.)

However, nothing in McCorkle discloses or suggests that a pattern of a signal generated by the wavelet code generator 242 and a pattern of a signal received at the antenna 200 have the relationship described above in amended claim 9. In particular, nothing in McCorkle discloses or suggests that a portion of the signal generated by the wavelet code generator 242 be substantially the same in shape and inverted in polarity with respect to a portion of the signal received at the antenna.

Based on at least the reasons given above, Applicant respectfully requests that the Examiner withdraw the rejection of claim 9 under 35 U.S.C. § 102(e) as being allegedly anticipated by McCorkle.

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Claim Rejections – 35 U.S.C. §103

The Examiner has rejected claims 12, 13, 17, 21, and 24 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Richards. Applicant respectfully traverses this rejection.

Claims 12 and 13 each ultimately depend from claim 10, and are allowable for at least the reasons given above for claim 10. Claim 17 ultimately depends from claim 14, and is allowable for at least the reasons given above for claim 14. Claim 21 depends from claim 20, and is allowable for at least the reasons given above for claim 20. Claim 24 depends from claim 23, and is allowable for at least the reasons given above for claim 23. What Richards does not disclose, it likewise does not suggest.

Therefore, for at least the reasons given above, Applicant respectfully requests that the Examiner withdraw the rejection of claims 12, 13, 17, 21, and 24 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Richards.

Allowable Subject Matter

The Examiner has indicated that claims 1-8 would be allowable if rewritten to overcome the objections in the pending Office Action. As noted above, Applicant has corrected the informalities noted by the Examiner. This places claims 1-8 in a condition that the Examiner has indicated is allowable.

Claim Amendments

By this response, Applicant has amended claim 1 to recite "a mixer for combining the UWB bi-phase signal," rather than "a mixer for combining the UWB bi-phase signals." This amendment is being made to correct a typographical error.

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By this response, Applicant has amended claim 11 to recite that "the second receive mode is an ultrawide bandwidth receive mode," rather than that "the first receive mode is an ultrawide bandwidth receive mode." This is made to conform claim 5 to the language of amended claim 10, which now recites "a switch for selecting . . . the modulated pulse stream when a second receive mode of operation is selected."

By this response, Applicant has amended claim 16 to eliminate the language regarding the first and second divided clock frequencies, since this language has been added to claim 14, from which claim 16 depends. This is not a cancellation of limitations, but rather an acknowledgement that the limitations have moved from claim 16 to claim 14.

These amendments are not being made to narrow the scope of the claims or to distinguish over a reference, but solely to better recite the claimed invention. As a result, they should not serve to limit the application of the doctrine of equivalents with respect to these claims.

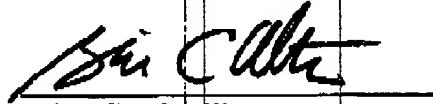
Conclusion

Accordingly, Applicant respectfully submits that the claims, as amended, clearly and patentably distinguish over the cited references of record and as such are deemed allowable. Such allowance is hereby earnestly and respectfully solicited at an early date. If the Examiner has any suggestions, comments, or questions, calls are welcome at the telephone number below.

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Although it is not anticipated that any additional fees are due or payable, the Commissioner is hereby authorized to charge any fees that may be required to Deposit Account No. 50-1147.

Respectfully Submitted,



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